



ROCHESTER

— Minnesota —

Building Safety Department

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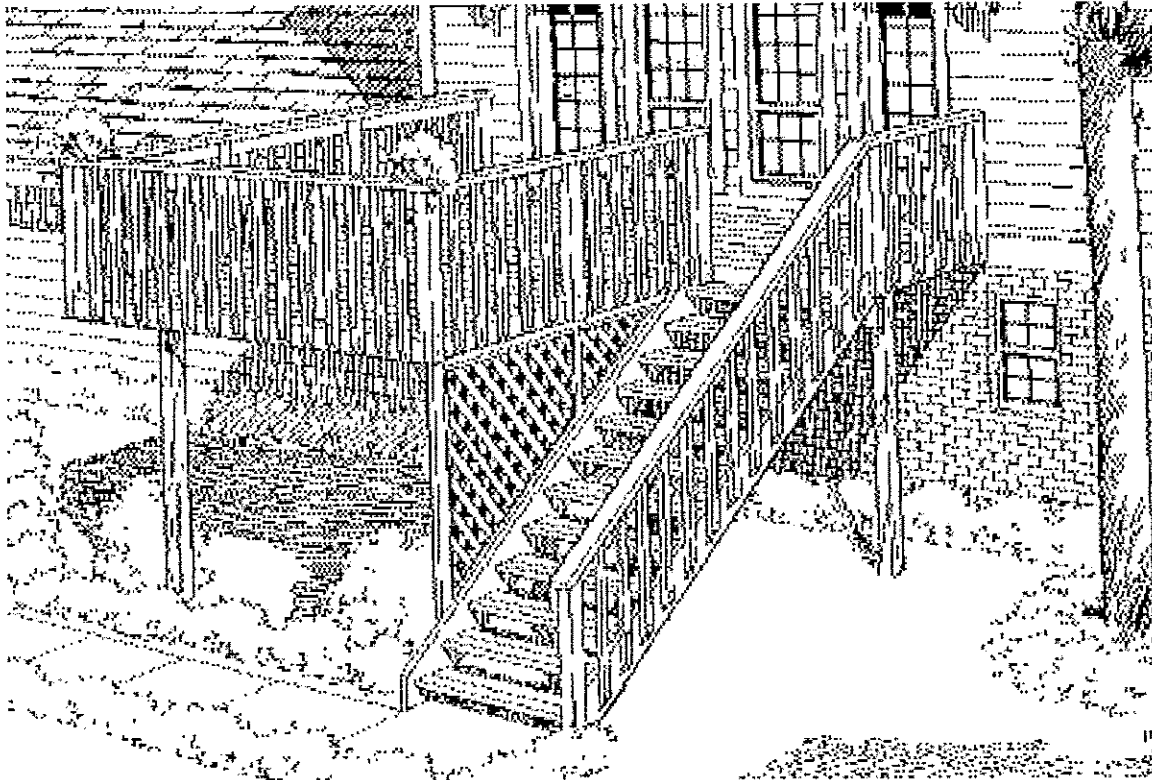
Office Hours: 8 am – 5 pm Monday thru Friday

www.rochestermn.gov

Residential Decks

1 & 2 Family Dwellings and Townhomes

Based on the 2007 Minnesota State Building Code



MR = Minnesota State Building Code extracted from 2007 Minnesota Rules

IRC = International Residential Code

NEC = National Electrical Code

Residential Decks

Building Permit Requirements:

Building permits are required for the construction of all decks that are attached to the home. Building permits are also required for freestanding decks that are elevated 30" or more above grade with supporting beams, joists, or posts. Deck construction shall meet the requirements of the 2007 Minnesota State Building Code which adopts and amends the 2006 International Residential Code.

Zoning and Land Use Requirements:

Decks are also required to meet the land use and setback requirements of the Rochester Land Development Manual and Zoning Ordinances. Zoning questions should be directed to the Rochester-Olmsted Planning Department at 507-328-7100.

Permit Fees:

The building permit fees are based on value of improvements and are designed to offset the expenses of plan review and inspection services. An estimate of the permit costs (based on the project's finished value) may be obtained by calling the Building Safety Department, or the fee schedule is also available at www.rochestermn.gov/bldgsafety.

Plan Review & Inspections:

The plan review is performed by the plans examiner prior to construction in order to identify potential problems or pitfalls. Typically the plan review for a residential deck will be done at the counter during normal office hours. Construction inspections will be done during the project to ensure code compliance and that the materials used are installed correctly. The plan review and inspections are not designed to be a guarantee of the work but they are performed to provide a reasonable degree of review and observation so the project will be successful, safe and long lasting.

Submittals for permit:

The following information is necessary for the Building Safety Department to do a proper plan review and to help the project go as smoothly as possible.

Note: Sample plans provided in this handout are intended as a guide only.

- A completed building permit application form.
- Two copies of the site plan. The site plan should indicate any existing structures, proposed deck location and lot dimensions (see sample site plan on page 4). A copy of the existing site plan may be obtained from the Building Safety Department if one is on file.
- Two copies of the construction plans showing the proposed design and materials. Plans shall be drawn to scale and indicate the following information:
 - A. A floor plan including the following: (see sample plans on pages 5 and 6)
 1. Proposed deck size with dimensions.
 2. Size and spacing of floor joists. (see page 10)
 3. Size and type of decking material.
 4. Size, location and spacing of posts including post connection to footing (see sample plan on page 5)
 5. Location of door and window openings adjacent to attachment of deck.
 6. Size of beams (see page 11). Also indicate post/beam connection (see beam connection details on page 7)
 7. Species and grade of lumber to be used.

- B. Elevations indicating the following: (see sample elevation on page 7)
1. Height of structure from established grade.
 2. Size and depth of footings.
 3. Guard construction to include height and spacing of intermediates (see pages 7 & 8)
 4. Stairway construction to include rise/run and handrail requirements (see pages 8 & 9)
 5. Clearance to overhead wires, if applicable. (see page 7)

Building Code Requirements:

- Footings shall be designed and constructed below frost depth. A 42" minimum ground cover in any direction is required from bottom of footing to grade. Footing holes must be free of water and muck at time of inspection. (see pages 5) MR 1303.1600
- Decks exposed to the weather must be constructed with wood of natural resistance to decay or treated wood. This includes horizontal members such as beams, joists, ledger boards and decking; and vertical members such as posts, poles, guards, handrails and columns. Other man made products such as composite decking are subject to approval by the Building Safety Department before use. Requirements for installation of composite decking may differ based on the manufacturer's installation instructions or on approved testing. MR 1303.2000
- Columns and posts supporting decks exposed to the weather or water splash must be supported and connected to concrete piers or metal pedestals. Columns and posts in contact with the ground or embedded in concrete must be of pressure treated wood approved for ground contact. IRC R319.1.2
- Decks shall be designed and constructed to support a minimum live load of 40 pounds per square foot. The dead load is assumed to be a minimum of 10 pounds per square foot, although some composite decks may require additional dead loads. Additional loads shall be considered if a spa or other equipment is to be placed on the deck. IRC R301.4, R301.5
- Ledger boards shall be bolted or lagged to the existing building framing with a minimum of one 1/2" x 5" lag screws or bolts at 8" on center with washers. All connections between the deck and dwelling must be flashed with corrosion-resistive flashing. (see page 5) IRC R502.2. Solid blocking must be provided for the attachment of the deck ledger board. IRC R502.2.2
- Verify ledger/rimboard connection at bump-outs. Alternate construction shown on page 6, must be indicated on the plan for independent construction from the house ledger. In lieu of this construction verification must be made prior to permit issuance and at the footing inspection that the house cantilever can support the additional loads of the proposed deck with a positive connection at the ledger/rimboard. IRC R502.2.2
- Fasteners and hangers are to be hot dipped galvanized steel, stainless steel or copper. Due to new lumber treating processes, additional requirements may apply. To meet load requirements the proper fasteners shall be provided per the hanger manufacturer. IRC R319.3
- Joists shall not cantilever beams by more than 2'-0", nor should beams cantilever posts by more than 1'-0" at each end. If a greater cantilever is desired, additional framing or design may be required.
- Decks built to support a future porch should be constructed so that all potential imposed loads are taken into consideration; full porch plans should be submitted for future reference.
- Safety glazing for windows and doors shall be required when the edge of a door is within 24" of a window, within 60" of a hot tub/spa water's edge, within 60" of the top stair landing/bottom stair tread or within 60" of the stair walking surface. IRC R308

- Floor joists and stair stringers spaced at 24" inches on center require a minimum 2" nominal decking. For floor joists and stair stringers spaced at 16" inches on center, 1" decking or 5/4" decking may be used. However, 16" joist spacing cannot be used if 1" or 5/4" decking is placed diagonally. Composite decking used for stair treads may require closer stair stringer spacing per manufacturer instructions such as 12 inches on center. IRC R502.2
- All decks, balconies or porches which are more than 30" above grade or a floor below must be protected by a guard a minimum of 36" above the finished deck surface. Guards and stair railings shall have horizontal, vertical, diagonal or other ornamental intermediate rails through which a sphere 4" in diameter cannot pass through. All glazing in guards and railings shall be safety glazing and adequately supported. (see pages 7 & 8) IRC R312
- Egress windows are allowed under decks provided the location of the deck allows the emergency escape window to be fully opened and provides a path not less than 36" in height to a yard or court. See emergency escape and rescue window handout. IRC R310.5
- Decks, porches, or balconies added to an existing dwelling must have a GFCI weatherproof receptacle added if the area exceeds 20 sq. ft. and has access from within the dwelling unit. See electrical handout.
- The National Electric Code requires overhead power lines to be located a minimum of 10'-0" above decks and platforms. This height must be maintained 36" beyond the edge. Existing lines may need to be raised if a new deck is to be installed beneath them. Contact Rochester Public Utilities at 507-288-1579 with any questions regarding relocation of power lines. See page 7.
- If the deck will encroach on a water or electrical meter and other equipment such as air conditioners contact Rochester Public Utilities at 507-280-1500 for regulations on clear space requirements. If the deck is encroaching on a gas meter contact Minnesota Energy Resources Corp. at 800-303-0752 or your gas supplier.

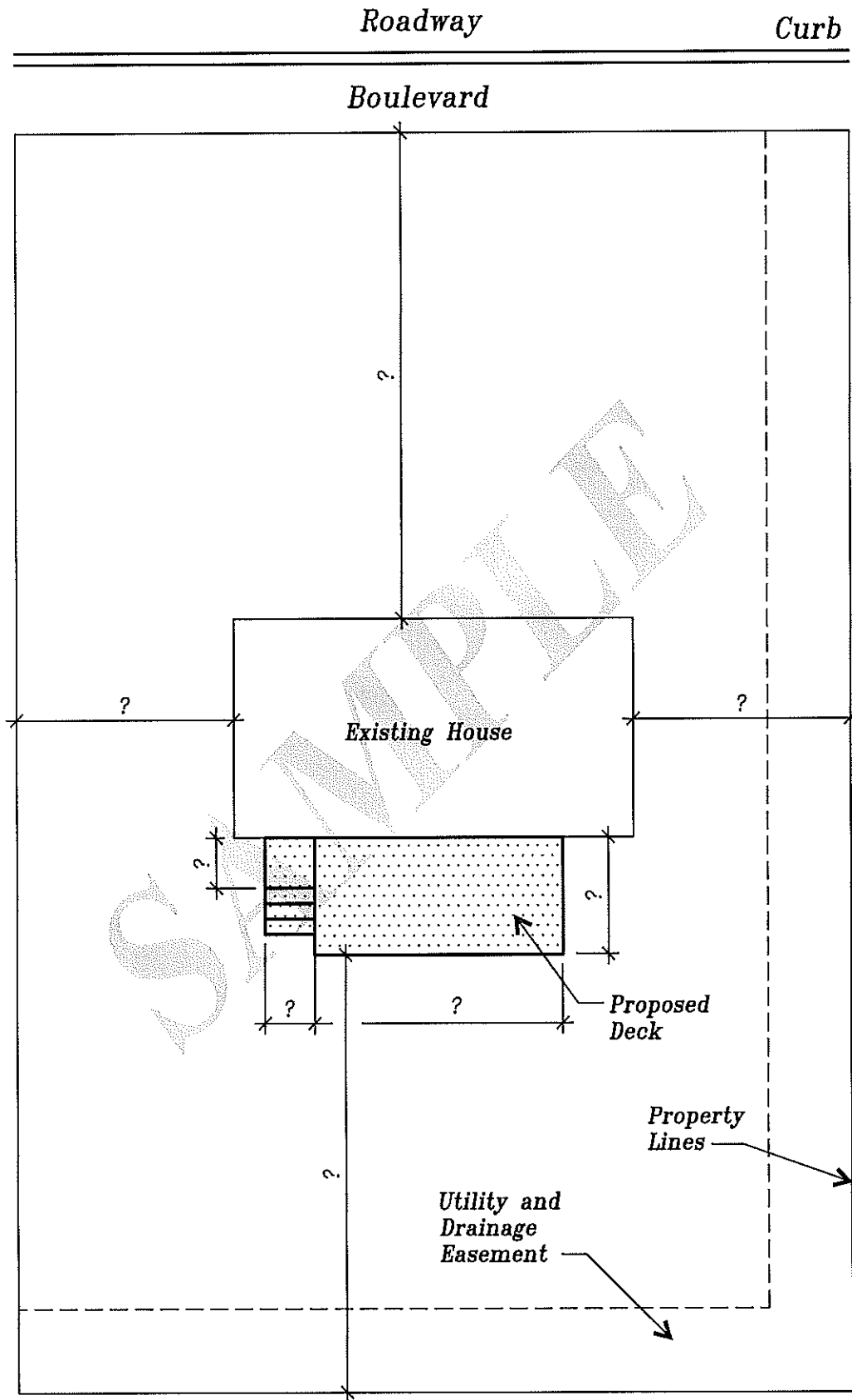
Required Inspections

- Every effort is made to perform all inspections the next business day following the request. Inspection requests must be received prior to 4:30 pm if the request is for next day service. Call 507-328-2600 to schedule an inspection and please have your permit number available when you call. Inspector's work schedules fill up fast at certain times of the year, so if you can call more than a day in advance you may avoid any potential delays in the progress of your project.
- Footings: To be made after the holes are dug to required depth and size, but **prior to pouring of the concrete!!**
- Final: To be made upon completion of the deck and finish grading.
- Other Inspections: In addition to the above inspections, the inspector may require other inspections to ensure compliance with the code.

General Notes

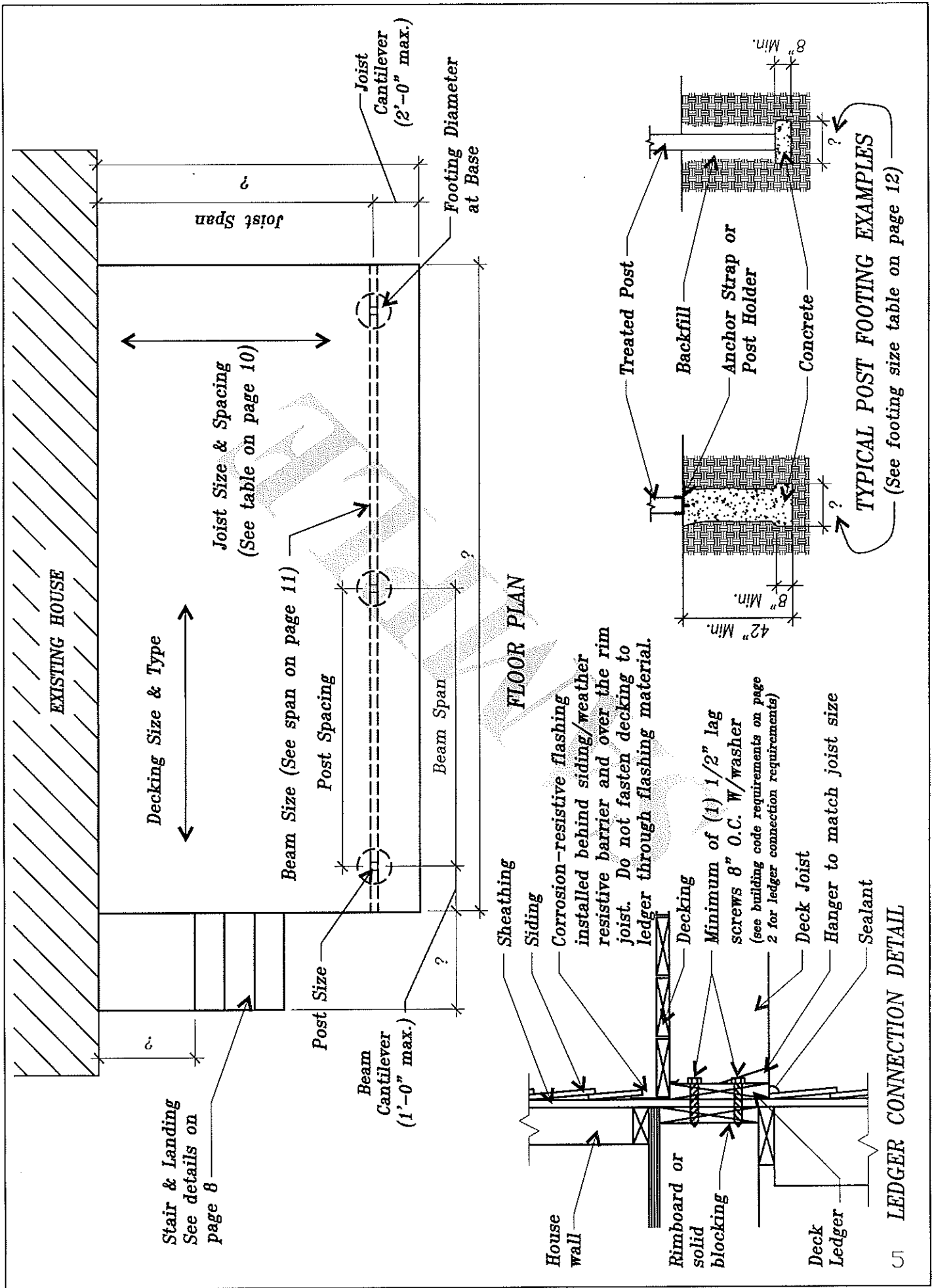
- The stamped approved set of plans, survey & inspection card shall be kept on the job site until the final inspection has been made and approved.
- All contractors must be licensed by the State of Minnesota, or have a Certificate of Exemption from the State of Minnesota.
- Call Gopher One at least 2 full days before you dig at 1-800-252-1166 or send an email to www.gopherstateonecall.org Gopher One's office hours are 7 am – 5 pm Mon. – Fri.

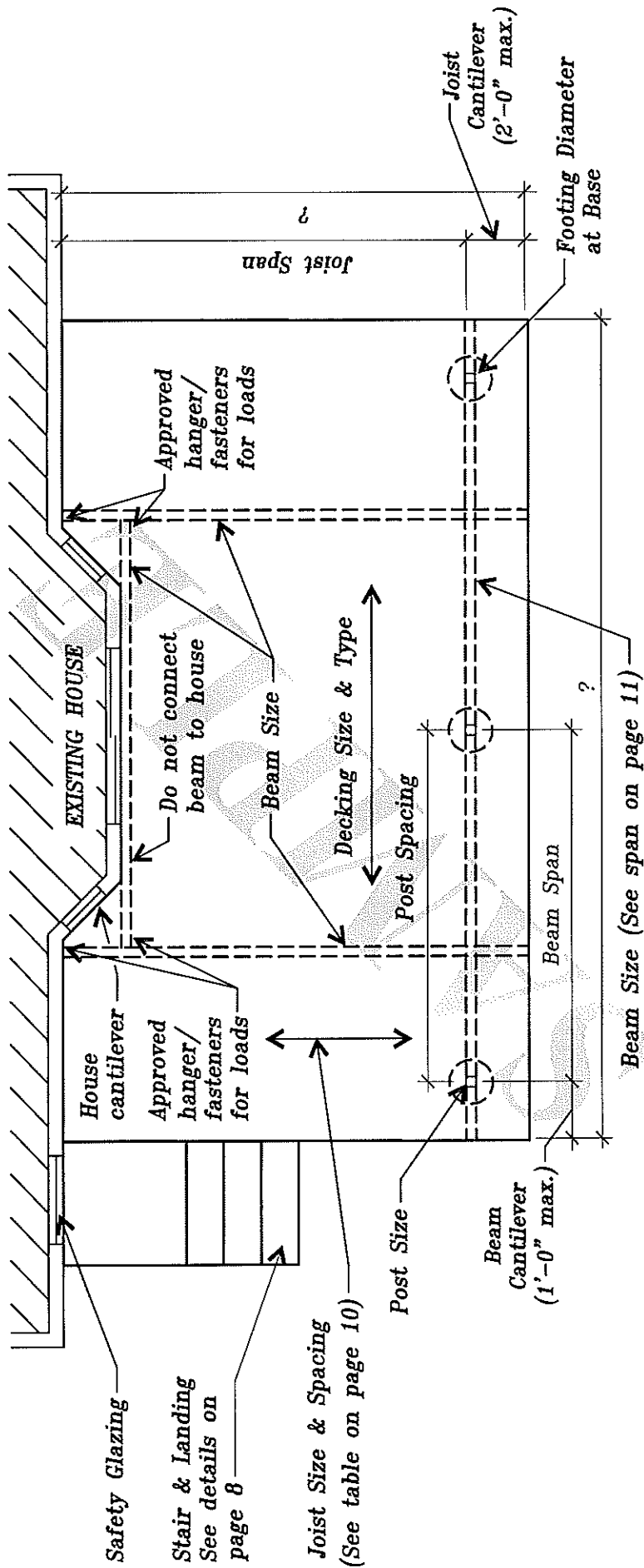
SAMPLE SITE PLAN



Note:

Show any additional structures that exist on the property (i.e. Pool, Shed etc.)

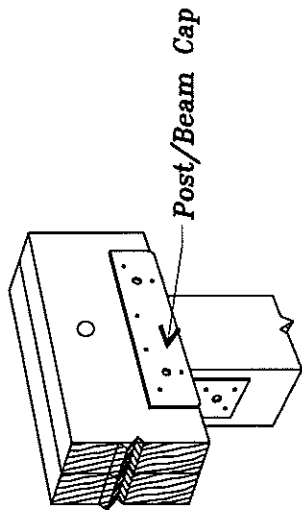




FLOOR PLAN WITH HOUSE CANTILEVER

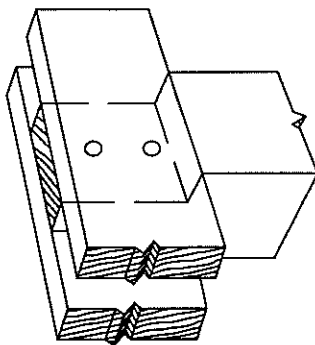
Note: House Cantilevers:

Some home designs include a cantilever of the floor system typically at the patio door. Decks shall not be attached to the house cantilever unless the floor framing is designed to support the additional deck loads.

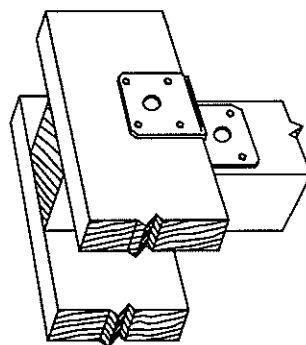


Top Mount

See manufacturer's specifications for limitations (specifications must be on site)



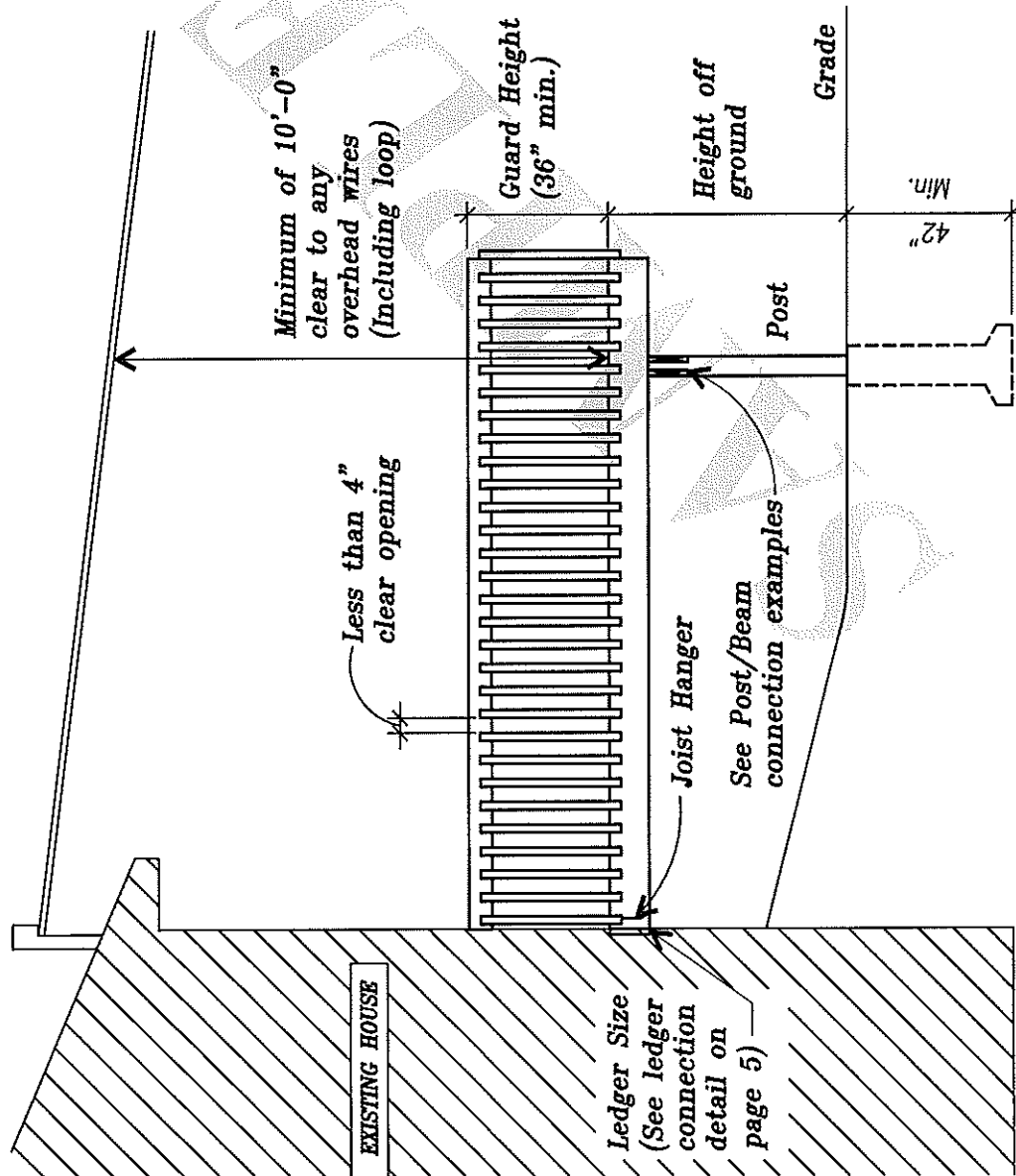
Notch Post
Min. (2) carriage bolts



Side Mount

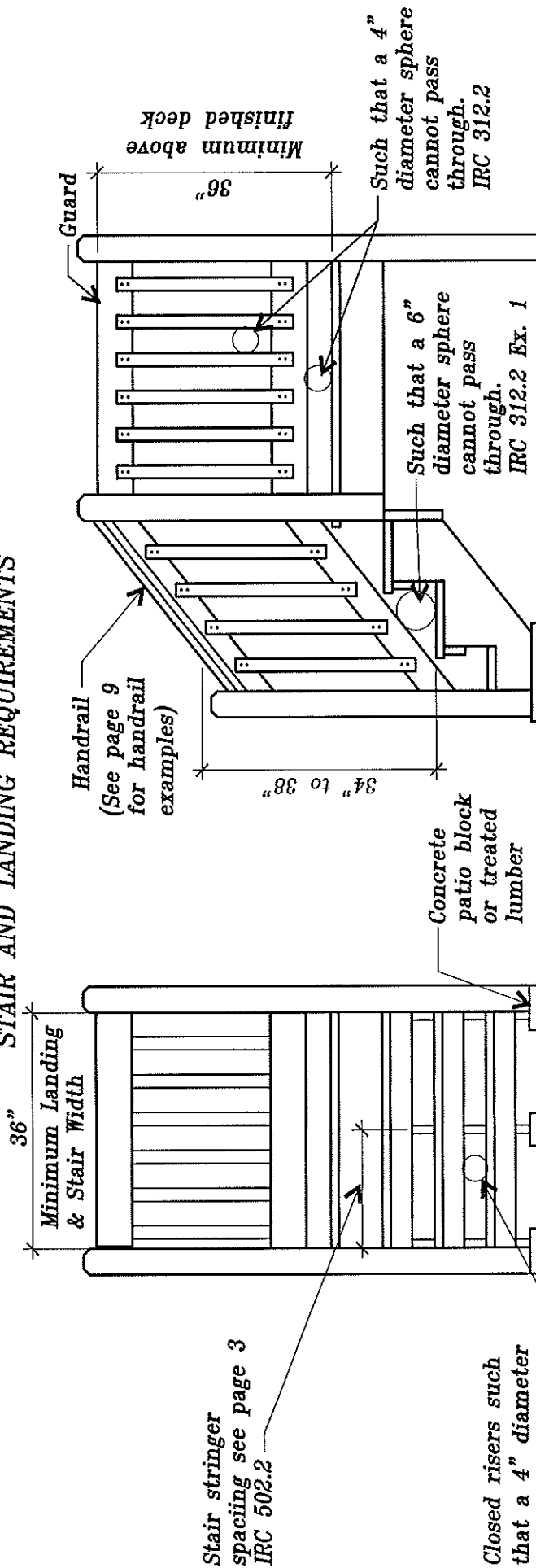
See manufacturer's specifications for limitations (specifications must be on site)

POST BEAM CONNECTIONS



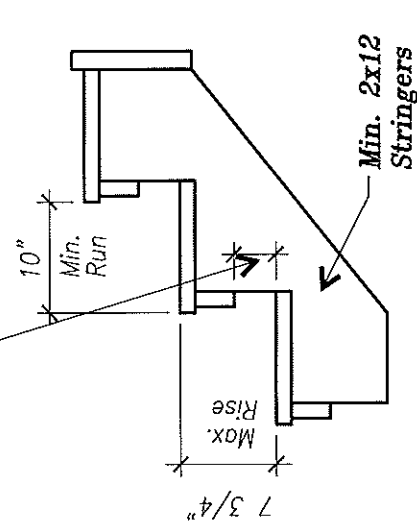
SIDE ELEVATION

STAIR AND LANDING REQUIREMENTS



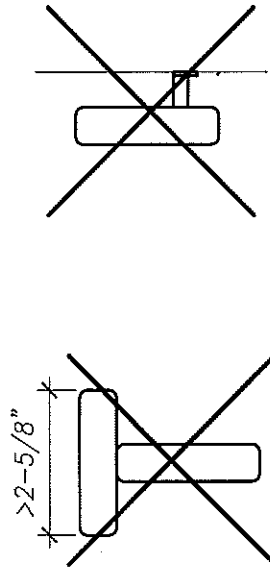
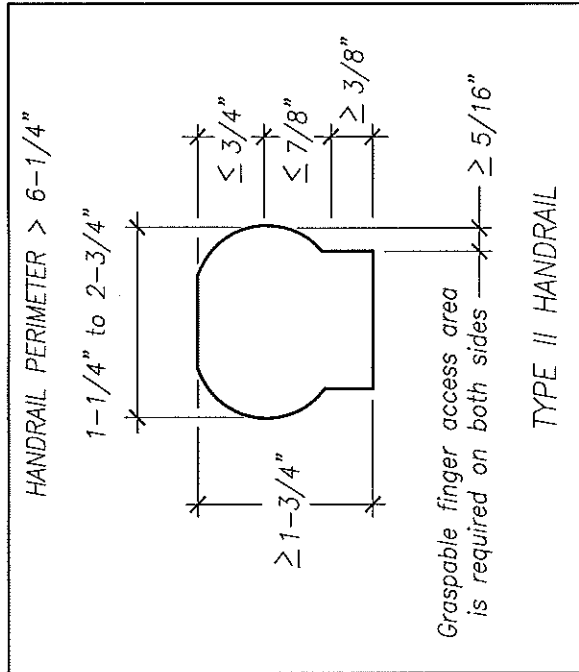
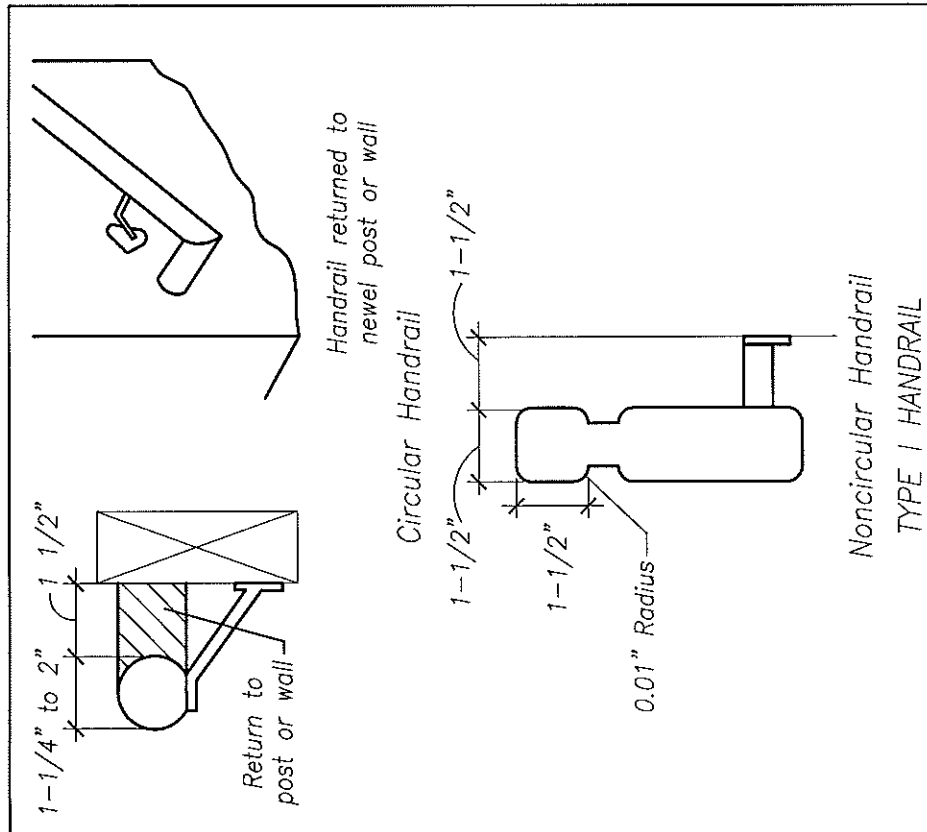
General Building Code Requirements

1. Stairways shall be supported on a concrete patio block or treated lumber pad.
2. Stairways to have a minimum width of 36" with a max. rise of 7 3/4" and a min. run of 10". The greatest riser height or tread depth in a flight of stairs shall not exceed the smallest by more than 3/8". IRC R311.5
3. A stairway with 4 or more risers shall have a handrail 34" to 38" above the nose of the tread to the top of the handrail. IRC R311.5.6
4. The handrail shall be continuous the full length of the stairway and shall terminate at a newel post or safety terminal at each end. IRC R311.5.6
5. A minimum 36" x 36" landing is required at the top of stairs. A landing or flat ground may be used at the bottom of stairs. IRC R311.5.4
6. The triangle area between the stair riser and tread at the bottom of the guard must be such that a sphere 6" in diameter cannot pass through. IRC R312.2 EX. 1
7. All decks, balconies or porches which are more than 30" above grade or a floor below must be protected by a guard a minimum of 36" above the finished surface. Guards and stair railings shall have horizontal, vertical or diagonal intermediate rails through which a sphere 4" in diameter cannot pass through. IRC R312



A nosing of not less than 3/4" but not more than 1 1/4" shall be provided on stairways with solid risers.

ACCEPTABLE HANDRAIL EXAMPLES



Not acceptable

Not acceptable

IRC R311.5.6.3: Handrail Grip Size

All required handrails shall be of one of the following types or provide equivalent graspability.

Type I: Handrails with a circular cross section shall have an outside diameter of at least 1-1/4" and not greater than 2". Noncircular shall have a perimeter of at least 4" and not greater than 6-1/4" with a max. cross section of 2-1/4". See the Type I details above.

Type II: Handrails greater than 6-1/4" shall provide a graspable finger access area on both sides of the profile. See the type II detail above.

JOIST SPAN TABLE

Based on No. 2 or better wood grades.
(Design load = 40 PSF LL+10 PSF DL, Deflection=1/360)

	Ponderosa Pine			Southern Pine		
	12" O.C.	16" O.C.	24" O.C.	12" O.C.	16" O.C.	24" O.C.
2x6	9'-2"	8'-4"	7'-10"	10'-4"	9'-5"	7'-10"
2x8	12'-1"	11'-0"	9'-0"	13'-8"	12'-5"	10'-2"
2x10	15'-5"	13'-6"	11'-0"	17'-5"	15'-10"	13'-1"
2x12	18'-1"	15'-8"	12'-10"	21'-2"	18'-10"	15'-5"

Joists shall be supported laterally at the ends by full depth solid blocking not less than 2" nominal thickness. IRC R502.7

Sample Calculations for Using Joist Span and Beam Size Tables

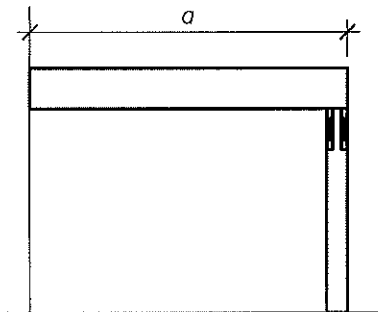
Refer to tables for joist and beam requirements.

Example $a=12'$; Post Spacing= $8'$

Use the Joist Span Table to find the acceptable joist sizes for a 12' span, 2x8's at 12" O.C., 2x10's at 16" O.C. or 2x12's at 24" O.C.

Use the Beam Table (see page 11) to find the 8' post spacing column.

With a 12' deck span, the beam may be either two 2x8's or two 2x10's, depending on wood used.

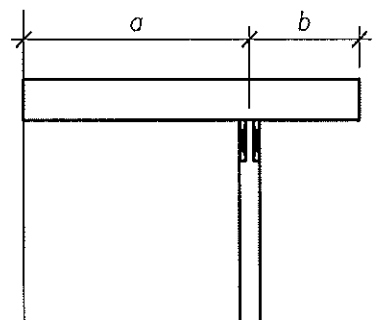


Example $a=8'$, $b=2'$, Post Spacing= $10'$

Use "a" to determine joist size and "a+b" to determine beam size. The length of "b" is restricted by both the length of "a" and the size of the joists.

Refer to the Joist Span Table. For an 8' joist span, either 2x8's at 24" O.C. or 2x6's at 16" O.C. area acceptable.

For sizing the beam, use a joist length of 10' ($8'+2'$) and a post spacing of 10'. The beam table indicates that the beam may be either two 2x10's or two 2x12's, depending on wood used.



BEAM SIZE TABLE

Based on No. 2 or better Ponderosa Pine and Southern Pine.

Treated for Weather and/or ground exposure

Beam size for up to 2'-0" joist cantilever

			POST SPACING (MEASURED CENTER TO CENTER)										
			4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
JOIST LENGTH (INCLUDING CANTILEVER)	6'	Southern Pine	1-2x6	1-2x6	2-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12
		Ponderosa Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12
	7'	Southern Pine	1-2x6	1-2x6	1-2x8	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10
		Ponderosa Pine	1-2x6	1-2x8	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12	ENG BM
	8'	Southern Pine	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12
		Ponderosa Pine	1-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	ENG BM
	9'	Southern Pine	1-2x6	1-2x6	1-2x8	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12
		Ponderosa Pine	1-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12	ENG BM	ENG BM
	10'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12
		Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12	ENG BM	ENG BM
	11'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12
		Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	ENG BM	ENG BM	ENG BM
	12'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12	ENG BM
		Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	3-2x12	3-2x12	ENG BM	ENG BM	ENG BM
	13'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x10	3-2x10	3-2x12	3-2x12	ENG BM
		Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x10	2-2x12	2-2x12	3-2x12	ENG BM	ENG BM	ENG BM	ENG BM
	14'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x12	ENG BM	ENG BM
		Ponderosa Pine	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	3-2x10	3-2x12	ENG BM	ENG BM	ENG BM	ENG BM
	15'	Southern Pine	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12	ENG BM	ENG BM
		Ponderosa Pine	2-2x6	2-2x8	2-2x8	2-2x10	3-2x10	3-2x12	3-2x12	ENG BM	ENG BM	ENG BM	ENG BM
	16'	Southern Pine	2-2x6	2-2x8	2-2x8	2-2x8	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	ENG BM	ENG BM
		Ponderosa Pine	2-2x6	2-2x8	2-2x10	2-2x10	3-2x10	3-2x12	3-2x12	ENG BM	ENG BM	ENG BM	ENG BM

***Note:**

Joist length is the total length of the joist including any cantilevers.

ENG BM = Engineered Beam

FOOTING SIZE TABLE

(Diameter)

		POST SPACING (MEASURED CENTER TO CENTER)										
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
JOIST LENGTH (INCLUDING CANTILEVER)	6'	12"	12"	14"	14"	16"	18"	18"	18"	18"	20"	20"
	7'	12"	14"	14"	16"	16"	18"	18"	18"	20"	20"	22"
	8'	12"	14"	14"	16"	18"	18"	18"	20"	20"	22"	22"
	9'	12"	14"	16"	16"	18"	18"	20"	20"	22"	22"	24"
	10'	14"	14"	16"	18"	18"	20"	20"	22"	22"	24"	24"
	11'	14"	16"	16"	18"	18"	20"	22"	22"	24"	24"	24"
	12'	14"	16"	18"	18"	20"	20"	22"	24"	24"	24"	26"
	13'	14"	16"	18"	18"	20"	22"	22"	24"	24"	26"	26"
	14'	16"	16"	18"	20"	20"	22"	24"	24"	26"	26"	28"
	15'	16"	18"	18"	20"	22"	22"	24"	26"	26"	28"	28"
	16'	16"	18"	20"	20"	22"	24"	24"	26"	26"	28"	28"

***Notes:**

Joist length is the total length of the joist including any cantilevers.

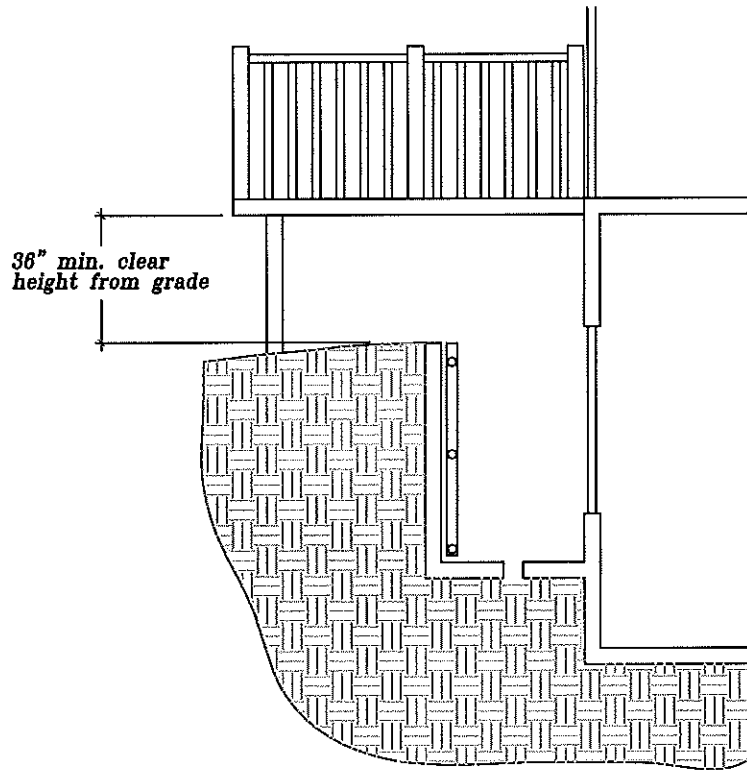
42" minimum ground cover is required from bottom of footing to grade.

The bottom 8" of the footing is required to have the appropriate diameter from the table above. This can be achieved by belling out the bottom of the hole. See page 5 for typical post footing examples.

For footings greater than 20 inches in diameter the thickness shall be increased to 12 inches.

Emergency Escapes below Decks

IRC R310.5



Deck Drawing Check List

- *Site Plan*
 - *Dimensions of the deck*
 - *Dimensions from property lines*
 - *Dimensions from adjacent structures on property*
- *Framing and Footing Information (Plan/Elevations)*
 - *Joist size, spacing and fasteners/hangers*
 - *Beam size and location (dimensions)*
 - *Post/Beam connection*
 - *Footing size, location and depth (dimensions)*
 - *Decking material, size and orientation (diagonally or perpendicular)*
 - *Ledger board, fasteners and flashing*
 - *Guardrail required if walking surface is 30" or more from grade (36" high guardrail)*
- *Stair Information (Detail)*
 - *Rise (max. of 7 $\frac{3}{4}$ ") and Run (min. of 10")*
 - *Opening at riser (less than 4")*
 - *Guardrail height (34" to 38" high guard)*
 - *Stair with 4 or more risers must have a graspable handrail (34" to 38" high)*
 - *Stringer size and spacing*
 - *Stair width (min. 36")*